it because of bloody disputes between the Shammar and Tay tribes. The land is poorer than in the north and the rainfall is much scarcer. Farmers who managed to plant barley on the fringes of the disputed land in the bad year of 1951 lost heavily. It is improbable that an average year would give much hope of profit.

Ras el Ain, though on the railway line, has less rainfall than Kamishli, Amuda, or Dirbassiya because the mountains recede north into Turkey. Dry farming is profitable less than 20 kms. south of Ras el Ain.

IV. The Khabur Valley

The Khabur river, though rising in Turkey, is fed by springs in Ras el Ain and flows southward for about 150 kms. within the Jazirah before it enters the Mohafaza of the Euphrates below Markada.

For about 20-30 kms. below Ras el Ain, the land is used for cereals, mainly barley, with varying degrees of success. But south of this area and down to Hassakeh, dry cultivation becomes risky. South of Hassakeh and to the east and west, dry cultivation becomes entirely out of the question because rainfall, already insufficient at Hassakeh, falls off sharply.

The inadequate rainfall is offset to a certain extent by the possibility of irrigation from the Khabur. Traces of old dams are apparent in several places, and canals which carried the waters from the dams are visible. History and legend leave no doubt that the valley was much more extensively exploited in former times than it is now.

Recently, when the price of rice rose during the War, farmers from the cities of Jazirah in search of irrigated land, began renting lands along the Khabur and installing motors and pumps. The necessary outlay of capital for any project of adequate size was substantial, not less thanLS 150,000, and the price of rice fell after 1946, so that perhaps not more than fifty irrigation projects existed up to 1949. It remained for the cotton boom of 1951 to boost this number to around 200 pumps.

The average size of pumps is 8" and the area irrigated by a pump of this size is around 500 dunums (125 acres). On some projects, where land is available, this area for summer crops is supplemented by an area twice this size in wheat and barley. But lands on both sides of the river rise steeply and rarely can an owner of an irrigation project find enough lands to use the pumps

full time winter and summer. This is one of the reasons why most projects on the Khabur have been failures. The overhead costs are very heavy in relation to the land available.

The Government has an irrigation project partly in operation which will irrigate when completed an area of about 100,000 dunums (25,000 acres). Other projects are under study but their execution will be postponed indefinitely since the Government lacks the necessary capital.

To summarize, it would appear that not only all cultivable lands in Jazirah are already cultivated, but that farmers, in search of lands, have started using marginal lands with insufficient rainfall, and unless the price of cereals keeps at the level of last year there will follow in the coming two years a gradual decrease in the area planted, with heavy losses to individual farmers.

POPULATION OF JAZIRAH

During Turkish rule and up to the French occupation, Jazirah was a wasteland controlled by Bedouin tribes whose submission to the Turkish law was nominal.

I. The Arab Tribes

The tribes, dominated by Shammar, ruled the land and spoiled it, frustrating all attempts at agriculture. They lived on sheep and camel breeding and charged tribute from merchants for protection, each tribe within its boundaries. Moslem and Christian families from Mardin and Nisibin owned lands around what is now Kamishli, Amuda and Dirbassiya, and they traded with the tribes, buying their wool, samneh, and hides and supplying them with their needs and credit. The ownership of land for agriculture seems to have been incidental to the commercial activities of these families.

The tribal boundaries established during the Ottoman rule are still effective. Shammar claims the right of grazing from the Iraqi border at Tal Koshak to Tal Alu and south to Fadghami on the Khabur. There is another small concentration of a Shammar branch around Derbassiya known as Shammar Ezzor.

The neighbor of Shammar to the west is the Tay tribe. Its lands extend from Kubur el Bid and Kamishli south to Tal Brak. The tribe took to agriculture relatively early and in its area are some of the best lands of Jazirah.

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charge a number of closely related functions such as the purchase and sale of farm supplies, the procurement and extension of credit and the marketing of farm products. The granting of loans and the sale of farm supplies are closely linked, and cooperative marketing would facilitate the collection of loans. For certain special functions such as irrigation, single-purpose cooperatives would be more appropriate. On balance the mission thinks it best that cooperatives be organized on the basis of unlimited liability, for only in this way will all the members have the greatest incentive to see that all the credit is effectively utilized and repaid. The mission has already indicated its view that cooperatives should be given credit at 6% rather than 8% interest. The cooperative's own lending, however, should be done at 8% to provide a margin for meeting operating costs and building up reserves.

Agricultural Extension and Community Work[21]

In most underdeveloped countries, programs to improve agricultural practices and yields founder because there is no organization and staff to work continuously with farmers, educating and assisting them and demonstrating to them the practical utility of better methods and techniques. In Syria, too, there exists no agricultural extension or educational service in that sense. To be sure, the various departments of the Ministry of Agriculture have representatives in the *mohafazats* or provinces dealing with such subjects as agricultural production, veterinary matters, plant protection and the like. But the time of these men is largely monopolized by various administrative tasks such as the enforcement of government regulations, crop reporting, locust control and similar matters. They do not have the opportunity, and sometimes not even the inclination, to work with individual farmers. Their contacts with villages are brief, sporadic and infrequent.

The mission has given considerable thought to the problem of organizing effective work among the agricultural population in the villages. Our conclusion is that this work would best be entrusted to a special rural community development organization. Other countries faced with a similar problem, like India and Pakistan, have launched such an organization; in India, where one has now been functioning for some years,

[21] See Annex C, p. 322.

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encouraging results have been achieved. The justification for a special organization rests primarily on the fact that a properly conceived village improvement program transcends the bounds of agriculture. Its principal task, of course, will always be to raise the standards of agriculture and animal husbandry, the source of livelihood of the villagers. Yet the living conditions of the 2,000,000 people living in villages of less than 5,000 inhabitants must be improved as a whole. Standards of housing, health and sanitation, and adult education must be raised, and better roads and community facilities provided. Moreover, the need for special techniques in approaching this entire problem argues in favor of a special organization. The government has neither the staff nor the funds to carry out all the urgent village improvements itself. Its task must be rather to stimulate and assist the villagers in mobilizing their resources for self-help. Only in this way can a development program achieve worthwhile results at the village level.

The program the mission has in mind calls for the progressive introduction of rural community leaders or workers into the villages. One community worker for about 4,000 people should suffice, and if on this basis he must cover a number of villages over an extended area, he should have an assistant, selected preferably from among the rural school teachers. The community worker, though a government employee, should have no administrative duties. His sole function should be to encourage and crystallize the villagers' desire for improvement. His training should be primarily agricultural, but he should also have sufficient knowledge of the other aspects of village life to suggest what can be done. Most of the things which can or should be done to better living conditions are rather elementary. The knowledge of the community worker, therefore, need not be profound. Moreover, he would be able to call upon the specialized services of the government for advice and assistance in dealing with problems with which he himself cannot cope. For instance, he should know enough to identify and prescribe measures for most of the prevalent diseases and pests which attack crops and livestock, but he may need help from the veterinarian or pathological service to deal with difficult cases or extensive outbreaks of disease. If he can awaken an interest in cooperatives, he will then need to call in a credit supervisor from the Agricultural Bank or an expert from the Ministry of Agriculture to launch one. He may get the villagers to start a program of constructing latrines, but need advice from the sanitation experts of the Ministry of Health on methods of construc-

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tion. Similarly, he may induce the villagers to work on improving village roads, but may have to go to the regional road engineer of the Ministry of Public Works for advice and the temporary loan of a truck. In many respects he will be the intermediary between the villagers and the government services which can assist them. In discharging his task he will obviously have to work closely with the regular local government officials such as the *moukhtar* of the village or the *mudir* of the *nahiye* or township. His success will largely depend on the support of these officials.

Ultimately there should be about 500 such community workers and 200 assistants. The extensive preparatory and organizational work involved in starting the program would be such, however, that only about 12 community workers would be operating at the end of six years. Thereafter, the program would gain momentum, with the number of workers doubling each year so that the target could be attained in another six years. For the first six years the mission envisages a total expenditure of £S 2.7 million, but by the end of 12 years annual expenditures of £S 7 million would be required.

The mission suggests that the rural community improvement organization be headed by a special administrator directly responsible to the prime minister and the council of ministers. He should recruit a number of foreign experts to help with the necessary training and planning and the initial implementation. This group would include persons experienced in general community work, public health, agriculture and housing. The FAO and such organizations as the Near East Foundation and the Ford Foundation might be asked to provide the necessary personnel. The experience of the Near East Foundation, which has been operating a number of pilot community projects along the same lines in the Ghouta around Damascus, would be particularly helpful. The foreign experts would be primarily responsible for planning and training. They should draw up a basic handbook which would be a compendium of practical measures which community workers can apply and would offer them guidance in techniques of stimulating and organizing community action. They would plan the necessary training courses for community workers in the secondary agricultural school and assist in introducing instruction on the elements of community development work in the university, teachers' training colleges and other schools. Their assistance will also be needed in holding regional seminars in which local officials would be acquainted with the objectives and methods of the program.

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Other government services must be effectively tied in with the community improvement program. At the national level, therefore, the administrator should be assisted by a coordinating and policy-making council on which the Ministries of Agriculture, Public Health, Education, Public Works and National Economy, and the Agricultural Bank would all be represented. Similarly, the work at the provincial or county level should be coordinated by a council representing the cooperating government services and chaired by the *mohafez* or the *kaimakam*. In fact, the community worker might best be attached to the office of the *mohafez* or *kaimakam*.

The inauguration and expansion of this rural community improvement organization will increase rather than diminish the demand for the services of the specialized officers of the Ministry of Agriculture. More agronomists, veterinarians and plant protection experts will be needed to make frequent visits to villages either on their own initiative or on request for the purpose of helping and advising community workers. In the beginning these specialists will serve a dual role, carrying out their present administrative tasks and giving technical supervision and guidance to the village workers. With further expansion of the community development system, however, the services of full-time technical specialists will be required. This will allow for the separation of administrative and regulatory functions from educational and demonstration activities, thus making it possible for the technical specialists to develop a closer personal working relationship with the villagers. The return of people now studying abroad will enable the Ministry to strengthen its staff in the provinces, but more personnel will also have to be recruited from the secondary agricultural school.

Agricultural Education and Staffing[22]

Repeatedly the mission has emphasized the vital need for more trained staff if the government is to discharge its responsibility for raising the standard of agriculture and animal husbandry. This points to the need for providing much greater facilities for education in agriculture at the secondary school and university levels. The mission has considered a suggestion to establish a faculty at the Syrian University to provide the higher education in agriculture and veterinary science for which students

[22] See Annex C, p. 318.

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1. alluvial	200
2. black	100
3. chestnut brown and terra rossa	1,500
4. brown and reddish-brown	3,500
5. grey sub-desert	9,000

The remaining 3.7 million hectares is covered by lithasols, eroded rendzina, and saline soils, which for the greater part have no agricultural significance.

Unfortunately, the three best soil types represent no more than about 10% of Syria's total surface area of about 18 million hectares, and it is on these soils only that a wide variety of crops can be grown. Almost all of the brown and reddish-brown soils, covering 20% of the land area, fall in the inner region of the fertile crescent belt where steppe conditions prevail. These soils are most appropriate for the cultivation of cereals and small grains, and are utilized for such purposes in similar regions throughout the world. The grey sub-desert soils (50%) are used primarily for pasture; crop production is possible only under irrigation.

This evaluation serves only as a rough guide to detailed agrogeological soil maps. A more detailed survey of Syrian soils is in progress and it is imperative that it be continued, since soil maps are essential for planning, and, together with data on climate, may be used to determine the types and quantities of crops which may be cultivated to the greatest economic and social advantage. They would also be of the greatest importance for the assessment of taxes on land holdings, should such a tax be instituted.

Soil Fertility and Agricultural Use

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Soil fertility and usefulness depend not only on type but also on profile, that is, the layers or horizons (topsoil and subsoils) of soil materials of various colors, on the chemical composition and on the configuration of the terrain and its water supply.

The depth of profile determines the root rate and the bulk of material available for nutrition, and also indicates the total soil water available—a consideration of importance in view of Syria's semi-arid conditions. Here shallow soils, even the best type, are of limited value only; being more prone to drought than deep ones they are more hazardous as an agricultural base.

Chemical composition of the soil, especially the topsoil, also has an im-

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134 portant bearing on fertility, for soils lacking a balance of the main elements
242 (nitrogen, potassium and phosphorus) or deficient in some of the minor elements (calcium, magnesium, etc.) are worthless for agriculture. Nitrogen, the most essential element in plant growth, is extracted from the soil during the growing period. In Syria, the customary method of restoring nitrogen is to leave the land fallow; for centuries this has been done rather successfully in the Hauran and elsewhere. The period of fallow—one, two or three years or more—depends on the type of crop, and, as far as the soil is concerned, the group, quality, depth and restorative capacity. In addition to the customary fallow, Syrian farmers near populated centers use town refuse to restore soil fertility. Unfortunately cheap manure and compost are generally consumed for fuel, but in recent years the use of commercial fertilizers has increased, particularly for cotton and sugar beet. While the Syrian farmers are aware of the importance of better crop rotation practices, improvement of soils through green manuring and leguminous crops is in its infancy.

During the last two decades huge tracts have been opened up, especially in the Jezireh. This land has been idle for centuries and its reserve of chemical compounds caused by decomposition of the natural vegetation is considerable. Though very good soils do exist, particularly in the northeastern parts, the magnitude of the stored elements has generally been overestimated. The reserves, particularly of nitrogen, are not inexhaustible. The virgin soil of the Jezireh has often been compared with virgin soil types in Russia, the United States and Europe but it must be remembered that in Syria the humus has not been so abundant as in humid climates, so that the nitrogen reserve is very limited. When that reserve falls below a certain level soil productivity decreases rapidly even if other elements are in plenti-
[311] ful supply. In Syria continuous exploitation under a monocultural system has resulted in decreased yields in certain areas, notably the Jezireh, where the danger is not yet fully recognized. Even artificial fertilizers cannot replace organic enrichment and the fallow system in its present form is far from sufficient to maintain fertility. New farm techniques, a changed rotation system and increased use of green manuring and fertilizers are urgent needs.

It is believed that Syrian soils are not generally deficient in phosphorus, important for growth and for the forming of grains and seeds, although chemical analyses indicate the total phosphorus available rather than the amount which can actually be absorbed by the plant. Assimilation depends

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largely on the acidity of the soil, and the p.H.[3] of practically all Syrian soil is between seven and eight. Most of the phosphorus is blocked. Whereas nitrogen and phosphorus deficiencies can be observed in almost all Syrian crops in various stages, very little indication of potassium shortage has been noted.

Besides the three main elements, the tracer elements iron, manganese, zinc, boron, copper and molybdenum are quite significant. A shortage or lack of one or another can result in low yields, even in soils generally classified as very good. The application of tracer elements e.g., the application of zinc and copper to fiber plants, citrus fruits, etc., has shown remarkable yield increases in other parts of the world. Unfortunately, very few studies of soil fertility and plant growth conditions have been conducted in Syria. Those made by Bracken for winter and summer crops and by Ibrahim Boules for cotton have indicated a general shortage of nitrogen, a disputable lack of phosphorus and rather favorable conditions as regards potassium. The excellent studies and surveys conducted by an FAO soil expert during the last few years have not been sufficiently intensive or extensive so far to form the basis of definite conclusions. But the mission is convinced that a thorough soil survey on the lines already begun by these specialists will be of great assistance in increasing the agricultural area and production. The compilation of the information thus gained, together with data on climate and water resources will be of much value in ensuring a sound rational basis for agricultural planning and development. Aerial mapping is a necessary adjunct to ground surveys and the successful coordination of the undertaking will require the development of a cartographic office.

II CEREALS

Wheat and Barley

Syria is fortunate in being able normally to harvest its wheat and barley approximately one month earlier than American and European cereals; consequently they can be brought on to the European market at the time

[3] p.H. values indicate relative acidity or alkalinity. Values run from 0 to 14, 7 indicating neutrality, numbers less than 7 increasing acidity, and numbers greater than 7 increasing alkalinity.

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desirable that a modern abattoir be built in a more suitable location; the present problem of drainage disposal would alone warrant this measure. There should be no difficulty about the provision of capital for such a project, since the municipal authority can recoup its expenditures by the collection of fees.

222. The present budget of £S 188,000[8] for personnel and equipment bears no relation to the value of Syrian livestock or to preventable losses. For more effective disease control the mission has recommended that an additional £S 1.2 million be made available during the next six years.

IX EDUCATION, RESEARCH AND EXTENSION

Education

Elementary agricultural education. Since 1949 the rural elementary schools have devoted the two final years (fourth and fifth grades) to theoretical and practical instruction in agriculture and hygiene. At present 111 offering this type of instruction, each with a field of five *donums*[9] for practical field training, are distributed through *mohafazats* as follows:

Damascus	37	Dera'a	13
Aleppo	9	Soueida	11
Latakia	11	Deir ez Zor	9
Hama	5	Hasetche	5
Homs	11		

The pupils (9,000 in 1954) learn the basic principles and techniques of agriculture, practicing them in the school gardens.

Clearly this number of schools cannot provide basic rural education for all the children of Syria's 5,500 villages. Apart from the need to build more schools and enlarge existing ones, a way must be found to train additional agricultural teachers; the teacher training and secondary agricultural schools in Dera'a and Kharabo do not turn out sufficient numbers.

The mission therefore makes the following recommendations:

[8] £S 50,000 for laborers at the Damascus veterinary research center and in the provinces; £S 40,000 for purchase of animals and feed; £S 98,000 for technical requirements (£S 20,000 for the Damascus laboratory; £S 58,000 for the preparation of vaccines and biologics material; and £S 20,000 for medicines in respect of the treatment of parasitical diseases).

[9] A donum = 0.1 hectare.

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1. A number of village school teachers should be given an intensive one-year course in agriculture.

2. Agricultural courses could be profitably substituted for some of the less essential subjects in the rural curricula, as teachers become available.

3. Night classes in agricultural education should be established in the rural elementary schools.

4. Rural elementary school pupils should be encouraged to organize societies to continue their activities outside school and school gardens.

5. Forest farm crops should be included in school gardens, and tree planting should be encouraged on national holidays. Each pupil could be responsible for a tree planted during his school training.

Secondary agricultural education. There is one agricultural vocational school in each of the provinces of Damascus, Homs, Aleppo, Latakia and Euphrates but of these four are intermediate schools and only the one at Kharabo (near Damascus) can be classified as a fully-rated secondary school. About 500 students are enrolled in all five schools. Some of the graduates subsequently engage in farming; the great majority apparently become government employees in the agricultural or in other services.

In the future these schools will be called upon to meet the growing personnel requirements of the government's agricultural, livestock, veterinary and forestry services. At Kharabo particularly, future technicians should be trained to assist in research and extension work. The present four-year curriculum includes all the elements necessary for a general understanding of today's agriculture and its future development, but students should be given an opportunity to specialize, at least during the third and fourth years, in such subjects as rural credit, crop production, livestock and animal husbandry, mechanization and techniques of industrial utilization of agricultural products, e.g., dairy products, fruit preservation, vegetable and meat marketing, tobacco curing, vegetable oil production, meat processing and curing, and the tanning of skins and hides. Better still, two or even three years of training should be added to give the students three or four years of specialization and bring them ultimately to the junior college level.

In the mission's opinion, the curricula of all agricultural schools emphasize theoretical studies too much and practical training too little. Effective farm managers and extension agents must be willing and able to demonstrate with their hands what should be done on the farm. To obtain the respect of the peasants they must be willing to get their hands dirty

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and able to do the practical work on the farm themselves. We suggest therefore that the present curricula be reviewed by a committee consisting of representatives of the Ministry and agriculturists, with the object of putting greater stress on manual training and on practical problems.

There is need for a vocational agricultural school in the Djebel Druze and the Hauran. For the time being this need could be met by broadening the curriculum of the Dera'a school, including special courses in agriculture. Stress should be laid on horticulture and fruit processing. In addition, at least one other school, preferably at Aleppo, should be raised to the same standards as Kharabo.

Elsewhere we have recommended that the curriculum include a mechanical training course.

We have also recommended the establishment of a secondary agricultural vocational school in Kamichliye. It should be located on soil most typical of the region and should have grounds adequate for experimental and demonstration plots, including an irrigation area. This school should become the headquarters for all agricultural education and extension work in the Jezireh; its curriculum should include courses on farming systems and the economics of mechanized agriculture. The third and fourth year curriculum should permit a choice between a technical course of study oriented towards machinery, repairs and maintenance, and an administrative course of study emphasizing economics and administration. We would expect enrollment to be 100-150 from 1957 on.

Adult education. Farmers should have an opportunity for formal instruction in the principles of good farm management and animal husbandry. Elsewhere we have suggested a pilot fundamental education program which would, among other things, include agriculture in its scope. Quite apart from this we believe that the rural elementary schools which provide instruction in agriculture should offer evening courses in which, with the help of proper visual aids, farmers could learn about improved crop rotation, better cultivation and weed control, means of identifying and combating pests and diseases and the like. Mobile trailers equipped with slide and moving picture projectors might be useful. In addition, we suggest raising the standards of mechanical farming by starting special courses at Kamichliye and probably at Aleppo for machinery owners, operators and mechanics. The first would be taught how to select proper farm machinery, supervise its operation and would learn the economics of mechanical farming. The second would be given practical training in opera-

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tion, maintenance and elementary repair of machinery. These courses could be organized with the help of an FAO expert and in cooperation with farm machinery dealers. They might be given under the aegis of the agricultural school at Aleppo and the proposed school at Kamichliye.

Certificates of competence should be awarded after suitable tests; if employers were to increase the pay of holders of such certificates, this might provide an incentive to workers to take such courses.

University level. Syria has no agricultural college or faculty; all the top staff of the Ministry of Agriculture have been trained abroad. The government and the Ministry send students to Egypt, Europe and the United States; the FAO and other organizations grant fellowships to Syrians. In 1953, 58 agricultural students were studying abroad in various fields—37 in Egypt, 11 in France and 10 in the United States.

Syria will be in great need of agronomists, agriculturists and veterinarians in the coming years. For the time being the total of fellowships should be increased to permit foreign study by 15-20 more students each year. The curriculum of the secondary school should also be expanded, as indicated above, to include one or two years of special work, for immediate and pressing needs.

Research

Syria had 18 experimental stations in 1954. They are well dispersed throughout the provinces and have reasonably good facilities and adequate grounds. Eight of the stations, in the provinces of Damascus, Hauran, Homs, Hama, Euphrates and the Jezireh, are engaged mainly in cereal and field crop research; the rest in horticultural work. Unfortunately, the stations work more or less independently of each other and this lack of coordination, coupled with staff and budgetary deficiencies, greatly impairs their effectiveness.

Despite the government's commendable efforts to offer Syrian personnel courses of study abroad, well-trained agronomists, horticulturists, agricultural engineers, zoological technicians and veterinarians will be lacking for some years to come. This suggests the advisability of limiting the extent of experimentation in the 18 understaffed stations.

Coordinated and central programming for future research is essential; this should be the task of one station, which may become the nucleus of a future Central Research Station. For the time being, we suggest that

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activities be allocated among five departments which might later be incorporated into such a central station: soil; farm crop and horticulture; plant pathology and entomology; agricultural engineering; and rural economics. It has already been indicated that there should be a separate livestock center.

The embryo Central Research Station should assemble and evaluate research work already done in such fields as cereals and cotton; it should engage in intensive rather than extensive research. Existing stations should undertake seed selection and propagation. In the course of time some of these stations might become sub-stations of the C.R.S. with responsibility for carrying out the experimental and demonstration programs to be planned each year by the C.R.S. But this stage cannot be reached until the sub-stations are adequately staffed with competent research and field personnel.

The mission recommends consideration of:

1. the establishment of a Central Research Station, preferably in the Damascus area, with ample experimental grounds for future expansion;
2. the recruiting of foreign experts (with the help of interested international institutions) to head the proposed departments;
3. provision for training abroad of future Syrian staff; and
4. a decision on priorities for the building program in connection with the experimental program.

Extension Service

Annex E refers to the inadequacy of the present extension service in furnishing guidance to the farmers. The Ministry of Agriculture has provided technical information in the form of pamphlets and films and has also arranged training courses for guidance officers, especially in cotton cultivation and the control of pests and diseases. In this regard more can be done and the mission strongly recommends that short training courses, of the kind recommended earlier, should be offered to farmers. The distribution of more posters, particularly relating to livestock, designed to be understood even by those who cannot read, should be encouraged. Extension officers could also be instrumental in furthering the adult education program mentioned above. More guidance could be given by private organizations, such as the Chamber of Agriculture already set up in each mohafazat, and farmers' cooperatives could be instrumental in providing

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and financing facilities for the presentation of pertinent information to farmers, and in organizing agricultural exhibitions.

The Chambers of Agriculture could also participate in regional programs for agricultural guidance, improvement of the care and breeding of sheep, goats and cattle, etc., and promotion of the various cottage industries. Close cooperation with the guidance department of the Ministry of Agriculture would make possible a national program to improve agricultural conditions, establish youth organizations, and stimulate growers' associations for cereals, cotton, sugar beet, tobacco, olive, fruits and other crops.

APPENDIX

TABLE 3 Nurseries and Research Stations

	Specialty	Approximate area (hectares)	Province
Damascus	horticulture	25	Damascus
Ezraa	field crops	200	Hauran
Tell Chehab	horticulture	20	Hauran
Soueida	horticulture	25	Soueida
Homs	horticulture and field crops	45	Homs
Hama	horticulture and field crops	40	Hama
Aleppo	horticulture	40	Aleppo
	cotton breeding		
Latakia	horticulture	30	Latakia
Sin	citrus	48	Latakia
Tartous	horticulture	20	Latakia
Harem	horticulture	20	Aleppo
Madrah	horticulture	20	Aleppo
	olives		
	pistachios		
Deir ez Zor	mixed	27	Euphrates
Hassetche	mixed	100	Jezireh

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312 653 185 *The Mission's Program*

The new irrigation projects recommended by the mission, together with those under way, call for a total expenditure of £S 193 million over the next five years, to which must be added £S 3 million for maintenance and £S 1.2 million for research and demonstration, giving a grand total of £S 197.2 million. Table 1 shows the allocations among projects, together with an indication of the areas to be irrigated. Appendix Table II sets forth the irrigation schemes.

TABLE 1 Mission's Proposed Irrigation Program, 1955–60

Irrigated area							
New area	Already irrigated	Total	Projects	Functions	Total	Already spent	To be spent in the program
43.0	22.0	65.0	El Ghab	D + GI	103[a]	1	102
0	0	0	Euphrates valley studies		3	—	3
4.5	4.0	8.5	Tell Magbass (LB) . .	GI	12	10	2
4.0	0.5	4.5	Roudj	D + GI	5	2	3
4.5	0.5	5.0	El Senn	GI + PI	3	2	1
4.6	0	4.6	Mazrib	PI	7	0	7
10.0	10.0	20.0	El Taf	GI	30	0	30
15.0	0	15.0	Barada	HEP + GI	30	0	30
3.5	0.5	4.0	Nahr el Kebir	HEP + GI	15	0	15
89.1	37.5	126.6			208	15	193

Key: GI – Gravity Irrigation; HEP – Hydroelectric Power; LB – Left Bank; PI – Pumping Irrigation; PC – Flood Control; D – Drainage; R – Regulation

[a] Including £8.47 million to be spent in a later program.

NOTE: Area figures in thousand hectares; expenditure figure in million £S.

185 312 242 III PLANNING

There are two stages of planning for irrigation projects. The first, the agricultural phase, entails a preliminary study of the soils and the computation of water duties. The technical phase includes planning of the civil engineering works necessary to divert, convey and distribute the water in the selected area. In the Main Report the mission has discussed the second

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planning stage. Here we add a comment with respect to the so-called agricultural phase.

In the past, soil studies were not very extensive, but projects were being constructed in areas already under cultivation, where the fertility of the soil was well known. Now FAO experts supervise systematic soil analyses, and the results of these studies will be very useful for the development of future projects. Insufficient investigation of the perviousness of the soil, with consequent underestimation of the water duty, has resulted in undercropping in some irrigated areas. A striking example is the Homs Lake project, where the allowance of 0.20 liters per hectare per second does not permit full utilization of the cultivable area.

The mission therefore recommends that henceforth more extensive research under the supervision of both irrigation and agricultural engineers precede fixing of the irrigation duty. Since the soils vary little along the alluvial plain of the Euphrates valley, these studies could be confined to plots in Raqqa, Deir ez Zor and Abou Kemal, on the plateau west of Raqqa and in the Resafe plain south of Abou Hareira. These experimental plots could be quite small, water being supplied by small pumping plants or even by tankers. Provision is made in the mission's proposed expenditure on studies of Euphrates valley irrigation for equipment of experimental stations.

IV WATER FEES

The fees for the various projects, according to the revised schedule for 1954, are shown in Table 2.

TABLE 2 Annual Water Fees per Hectare

(£S)

Project	Size of holdings in hectares				
	0 to 5	5 to 15	15 to 20	20 to 50	over 50
Homs-Hama	6.25	15.40	20.40	23.30	25.80
Tell Maghas	7.50	23.75	28.75	37.50	40.00
Mzerib	7.50	21.25	26.25	32.50	35.00
Senn	7.50	17.50	22.50	27.50	30.00
Makt	2.00	3.50	4.50	6.00	7.00

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III RECOMMENDED ORGANIZATIONAL FRAMEWORK FOR A SUPERVISED AGRICULTURAL CREDIT AND RURAL DEVELOPMENT PROGRAM

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The organization of the agricultural extension service should be such as to permit its ultimate development into the central agricultural agency through which educational activities relative to improved techniques in agriculture and rural living are channeled. In its particular sphere of activity the Extension Service should coordinate the findings of all departments within the Ministry of Agriculture. It should become eventually one of the three or four principal departments of the Ministry of Agriculture, separated from the research control or administrative work of the Ministry. For the present, however, it would seem desirable to retain the Division of Cooperatives and the Extension Service on the joint basis. The Extension Service should not have regulatory or police power functions, for this would involve education in the pleading of special causes or the enforcement of sanctions. Education and extension rather involve training on the basis of voluntary participation by farmers. At the national and regional level the Service should be staffed adequately to serve the village communities. It is recommended that an additional amount of £S 250,000 be provided during the next five years for personnel, travel and general operating expenses of the Extension Service.

There is a shortage of trained agriculturists. Steps should be taken to improve the teaching and research facilities of the four intermediate agricultural schools at Aleppo, Deir ez Zor, Latakia and Selemiye, and also at the secondary agricultural school at Kharabo. The extension worker needs a broad but well-grounded training in the technical aspects of agriculture, a good knowledge of social and economic problems in rural communities, and special training in extension methods and the philosophy underlying good extension work. In addition to pre-service training centers, it is essential that in-service and refresher courses be provided for extension personnel. The Food and Agriculture Organization should be requested to assist in the development of a training center for extension workers. This activity might well be supplemented by a cooperative arrangement between the Ministry of Agriculture and the Near East Foundation for the training of village community workers. The work of this Foundation provides a useful example of an effective method of reaching the small farmer. Scholarships

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for study abroad should be a necessary part of the training of the senior staff.

The findings of research, experimentation and the experiences of farmers give support to extension programs. Much information is already available and should be transmitted to farmers, but more systematic and better coordinated practical research should be the aim in the future. The two functions of research and extension should be coordinated within the Ministry of Agriculture so that each performs its specialized service, in a manner that supplements and complements the other. Research must focus on the key needs and concerns of farmers and anticipate future problems. For instance, one of the emerging needs is to know more about good crop rotation practices, including better use of land now fallow.

Chart 1 indicates the mission's conception of a desirable organizational framework for the agricultural credit and rural development program it has recommended.

IV LAND TENURE

In Syria, the landowner group is composed of full owners, part owners, debt-encumbered owners, and owners with undetermined title. Owners range from operators of large commercial farms to small subsistence farmers. The tenant group is composed of farmers who rent or make some payment for the use of land, and comprises most of the farmers who live on the land and cultivate it. Most of the large owners do not live permanently on their land but operate through some type of sharecropper system. There are very few cash tenants. The sharecropper usually works under the direction of the landlord or his agent and is dependent upon him for farm supplies and operating capital. Often he contributes toward crop production little but his own and his family's labor. His status is more nearly that of a laborer than of a tenant. A true tenant has rights of occupancy and land use that are protected by law, while the sharecropper is very much subject to the will of the landlord.

In general, it appears that in the rainfed areas the sharecropper receives about 30% of the crop if he provides only his labor, and around 70% if he provides the working capital. In areas sparsely settled he receives a slightly higher percentage of the crop, and in heavily populated areas he may receive somewhat less. On the irrigated lands the sharecropper receives in

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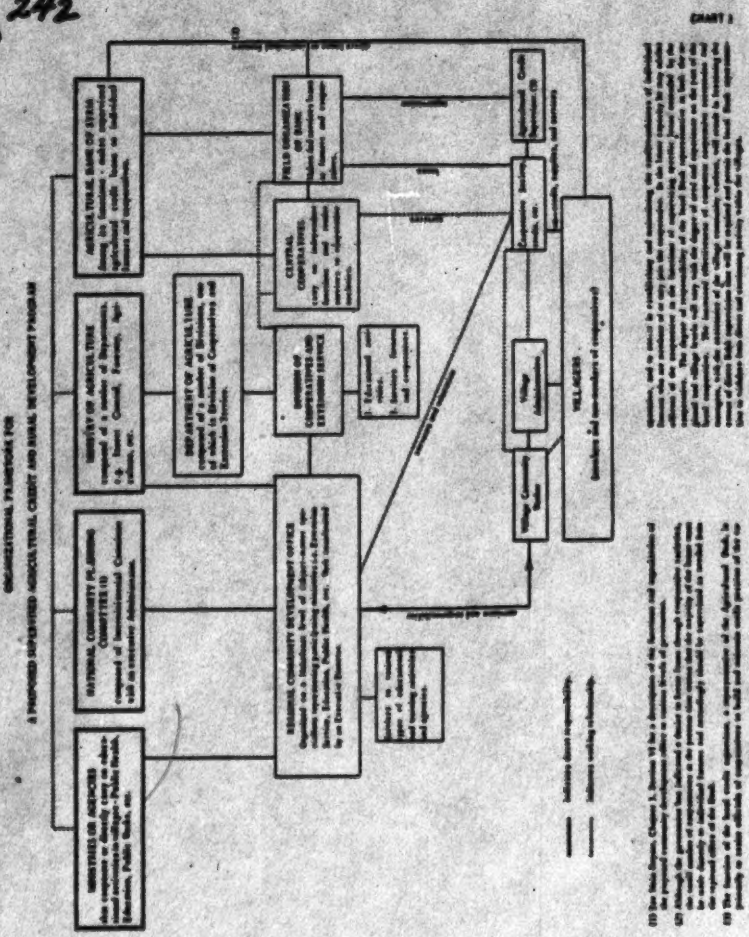

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654 training schools have been placed under the department and their budget increased some four to five times. Staffs of the research institutions have been expanded and the over-all program coordinated. It should be emphasized that these programs still are in the early stages of development.

TECHNICAL ASSISTANCE

648 242 Syria is not eligible for Mutual Security aid and so far has not seen fit to accept Point Four assistance. The United Nations, being international in character, is permitted to operate, and the Food and Agriculture Organization has a fairly large staff and an extensive program concentrated in the fields of cotton, home economics, veterinary science, farm machinery maintenance, and forestry. An FAO pathologist is working on problems of cotton diseases and insect controls.

A special FAO cotton mission, under the direction of an outstanding cotton technician, Dr. M. A. El Kilany Bey, former Under Secretary of State of the Egyptian Ministry of Agriculture, last year made a detailed study of cotton production and marketing problems and submitted a list of specific recommendations to the government. The recommendations called for rigid controls over production by areas; sterilization and controlled distribution of planting seed; an improved insect control program, including mandatory use of insecticides and destruction of stalks; tighter control over ginning and distribution of the products; and improved classification. Most of these recommendations have been adopted.

One of the most effective foreign organizations working in the country is the Near East Foundation, a small philanthropic agency with headquarters

Roller gins like these in Aleppo, Syria, are rapidly being replaced by the faster and more efficient saw gins. However, total capacity of all roller gins in Syria is still double that of the saw gins.

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COTTON IN SYRIA

in New York. The Foundation is engaged in research and education along the same general lines as in Iran, Lebanon, and Greece. With a small budget the Foundation has in its research learned many practical and useful ways of improving agricultural production. The methods they have devised in teaching simple home economics, such as canning, and principles of sanitation are exemplary. As a result, many villages in the area in which the Foundation operates have bought sewing machines and pressure cookers either with their own funds or with money given by the landlords. Particularly impressive is the practical nature of the work and the absence of a large administrative budget.

COTTON

Statistics on the area planted to cotton are also of questionable accuracy. For what they are worth, the figures show that cotton acreage declined almost 50 per cent from a prewar average of about 85,000 acres. It increased to about 60,000 acres during the five years after the war, and, with high prices, expanded further to almost 200,000 acres in 1950-51 and to about 450,000 acres in 1951-52. In 1952-53 it is expected acreage will be down, possibly just above the 1950-51 level.

Table 24

SYRIA: Statistics on Cotton Production and Distribution Specified Years, 1920-1951

Year Beginning August 1	Acreage	Yield per Acre	Production	Consumption	Exports
	Acres	Pounds	Bales		
Average 1920-24	NA	NA	4,700	NA	NA
Average 1925-29	56,625	82	9,951	NA	NA
Average 1930-34	42,258	116	16,199	NA	NA
Average 1935-39	84,477	157	28,022	NA	NA
Average 1940-44	47,445	152	15,380	NA	NA
Average 1945-49	58,878	254	31,111	23,100[1]	NA
1950	192,642	406	163,089	31,700	125,000
1951	450,000	220	206,681	32,400	139,000[2]

[1] Average for 1947-49.

[2] Exports September 1, 1951, through May 15, 1952.

SOURCE: Office of Foreign Agricultural Relations, United States Department of Agriculture.

YIELDS

Average yield figures are even more conjectural than acreage. The government's records indicate that the average yield increased from about 160 pounds in 1935-39 to better than half a bale in 1944-49 and to more than 400 pounds per acre in 1949-50 and 1950-51. Because of the large number of inexperienced cultivators, cold weather in the spring, lack of moisture and inadequate irrigation, and heavy insect damage, the 1951-52 yields were poor everywhere and the national average dropped to about 220 pounds per acre. Farmers in the new mechanized area of the Jezira reported losing 90 per cent of their crop. There is no doubt that cotton yields have been erratic.

VARIETIES

Lone Star was the only American Upland variety planted until Coker and Acala seeds were imported in recent years. These have produced good

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248 242 yields. The local experiment stations are doing a limited amount of work in variety selections and testing but have not been able to distribute any large quantity of certified seed. Most of the seed planted is imported directly from United States breeders or seed distributors.

CULTURAL PRACTICES

248 [407] A high percentage of the cotton land is now prepared with mechanical equipment, although a few primitive ploughs are still found. Some cotton is broadcast but for the most part it is planted in ridges. Planting is largely a hand operation in which the farmer digs a hole with a small hand tool and drops in five to seven seeds which have been soaked overnight to soften the shell and increase germination. The rows usually run east and west with the cotton planted on the south side for greater protection. Cultivation is almost entirely by hand with short-handle hoes or knives. Picking, as everywhere, is a family affair. Outside labor usually is required, especially on the large farms, to weed and harvest the crop.

Irrigation practices vary considerably. In general, farmers try to use as much water as they can. The use of commercial fertilizers, although increasing, is limited. Whenever possible manure mixed with soil is added to the cotton land.

On the Near East Foundation experimental farm, yields of 800 pounds of lint per acre were obtained by applying 30 inches of water to supplement the 12 inches of winter rain and 4 square meters of local manure per acre. The fields were prepared with tractors, but the cotton was planted and cultivated by hand. The rows were standard, about 36 inches wide, and three seeds were planted in the hills 12 inches apart. This is ample proof that cotton will grow well and give high yields with good cultural practices.

The Foundation's work also illustrates the need for research in cultural practices, irrigation, and especially fertilization. The soils generally need nitrogen, phosphorus, and potassium, but demonstrations reveal that the soil will react to certain of these plant foods but not to others. For instance, no difference in yields has been noticed from the use of super-phosphates. More research is needed, not only to determine optimum rates of application, but also to determine whether the absorption rates can be increased by conditioning the soil.

GINNING

248 407 Prior to 1950 all the cotton gins were of the roller type, many of which were manufactured locally. One modern American saw gin was installed in 1950 and it proved so successful that 26 more, with 82 stands, have been put into use since. Most of these are located in the Aleppo region. The new gins are, for the most part, equipped with the most modern overhead cleaning units and with standard gin presses. Buildings are unusually lavish. Investment in the average four-stand gin is estimated at $175,000 of which $120,000 is in the land and buildings. Even so, the cost of ginning is fairly moderate, about $9 per bale including bagging and ties.

About 1,700 roller gins are still in operation, three-fourths of them in Aleppo and most of the others in Hama and Latakia with a capacity double that of the saw gins.

The new saw gins still have a number of difficulties to overcome. The opinion persists that saw gins do not give fibers as long as roller gins, cause

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COTTON IN SYRIA

Table 26

SYRIA: Estimated Cost of Producing Cotton in the Upper Euphrates Valley on a Typical Tenant Cultivator Farm 1950

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Cost Items	Cost per Acre
	Dollars
Land preparation and plowing	10.96
Seed	2.07
Irrigation (fuel and amortization of engines and pumps)	19.09
Cultivation	6.22
Supervisor's salary	3.72
Harvesting	10.34
Miscellaneous	3.17
Total tenant's cost at plantation	56.47
Tenant's transportation cost to Aleppo	3.74
Tenant's ginning cost at 89 per bale	7.74
Tenant's cost for the ginned cotton from one acre	67.95
Estimated Yield per acre — 616 pounds of lint cotton per acre	
Rent at one-third of crop — 205 " " " " " "	
Tenant's share of lint — 411 pounds	
Estimated Yield per acre — 1,144 pounds of seed	
Rent at one-third of crop — 381 " " "	
Tenant's share of seed — 763 " " "	
Tenant's cost of ginned cotton	$67.95
Less credit for tenant's share of seed at $64 per ton	24.42
Tenant's net cost of ginned cotton	$43.53
Tenant's net cost of ginned cotton divided by pounds $\frac{\$43.53}{411}$	equals 10.59¢ net cost per pound

NOTE: This is a plantation with 250 acres of cotton grown under irrigation in the Upper Euphrates Valley. The landlord gets one-third of the seed cotton at the plantation for land rent. The tenant pays transportation and ginning cost only on his share of the production.

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SOURCE: Trade sources.

COTTONSEED OIL

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Nine crushing mills have a total capacity for approximately 500,000 tons of seed annually. Only four of these are primarily cottonseed oil mills—two in Aleppo, one in Damascus, and one in Hama. Capacity is adequate and prices slightly higher than those in the foreign markets, so most of the seed is now crushed in Syria. However, the extraction rate is low, especially in the older mills, and 1951 cottonseed oil production was given as only 5,000 tons. This represents about 40 per cent of the total vegetable oil produced in the country, the remainder being largely olive oil. Approximately 85 per cent of the cottonseed oil cake is consumed domestically as stock feed, with the other 15 per cent exported.

INSECTS

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The principal cotton destroying insects are the spiney bollworm, *Earias insulana* (Boisd.), and the locust. Last year the plant protection department of the Ministry of Agriculture distributed 250 tons of benzine hexachloride and farmers purchased 150 tons directly from dealers. Even so, yields were only half what they were reported to be the previous year and farmers at-

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242 tributed a 50 per cent decline in yields to insect damage.

248 In an effort to reduce this damage, the Ministry has employed an Egyptian entomologist and has bought 4,000 tons of insecticides and a large number of tractor-mounted, horse-drawn, and walking dusting units.

[656] The Ministry also has promulgated numerous regulations for controlling insects, calling for mandatory destruction of stalks after harvesting and a host-free period until May 1. All ginning must be completed by the end of April and all the gin trash burned. Planting seed must be sterilized by one of the oil mills through contract with the government. The government also requires all farmers to apply the recommended insecticides. If farmers do not comply, the government applies the poison and charges them for it.

CONTROLS

656 The government has appointed a Cotton Control Board, with head-
647 quarters in Aleppo, charged with the broad responsibility of stabilizing pro-
248 duction. The board is responsible for the enforcement of programs in seed distribution, insect control, crop control, ginning and marketing, and new regulations promulgated recently by the Ministry.

Probably the most significant of these many regulations is one limiting the land which may be planted to cotton. In irrigated areas from 40 to 70 per cent of the crop land may be planted to cotton and in dry-land farming areas, only 25 to 33 per cent. The Aleppo area is limited to 50 per cent of the non-irrigated land. The purposes of this regulation, according to the Director General of Agriculture, are to preserve a balance in agricultural

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Syria's newest cotton mill is an ultra modern integrated plant just completed in Deipsteque. The level of efficiency here is far above the average and as a result this mill is exporting about 20 per cent of its production.

ill-considered plans and avoid abrupt changes". A separate section in the Labour and Social Affairs Department of the Ministry of National Economy will run and supervise the centres, introduce local industries, study local conditions and implement a programme to raise the standard of living and promote local welfare. The Department will be assisted by an Advisory Committee comprising representatives from all agencies interested. Three bodies participate in the conduct of each model centre: one will consist of the staff members of the centre; the second the advisors to the staff members and the representatives of local administrative authorities; the third will be not one single committee but five committees of local residents, each to be responsible for a particular aspect of the centre. All will work under the supervision of the staff. The Decree defines the several units to be constituted for each centre and their respective responsibilities. 641 657 185

65. It is intended that when the Government has established a model centre in each province, the example will be followed in other districts by villagers who (as in the Egyptian prototype) will contribute to and share with the Government the expenses of maintaining a sufficient number of centres to cover the whole country.

66. The scheme which was inspired by the Cairo Seminar of 1950 had, we were informed, been discussed and agreed with other Ministries concerned and tentative arrangements had been made with the University authorities for their co-operation in providing the necessary personnel for the centres. Unfortunately, however, the project-law had not received the approval of the Ministers and Dr. Joukhadar gave no indication of any date for its operation. 242 185 474

67. On the introduction of Mr. Carroll Deyoe, FAO representative in Syria, members of the mission had the opportunity of meeting at the Ministry of Agriculture Mr. Akram Hakabi, the newly-appointed Secretary-General, who gave an account of agricultural extension work in Syria and of the development of agricultural co-operatives in the country. He foreshadowed a possible eventual use of the profits of these societies for community welfare purposes, but the movement is in its infancy.

68. Thanks also to the courtesy of Mr. Deyoe, the mission was put in touch with the local representatives of the Near East Foundation. In the absence in Beirut of the Programme Director, Mr. Eyer, his Deputy (Mr. Khoury) gave us the statement of the work of the Foundation in Syria which had been prepared for the recent Damascus Seminar which we had hoped to attend. Mr. Khoury accompanied us on his visit to Mashabeyeh one of the four villages in which the Foundation operates demonstration centres in agriculture and sanitation and in home-making, respectively. Mr. Sivaswamy has prepared a detailed account (Appendix V) of his impressions of the work done at Mashabeyeh. 242 185 744

69. The centre has been in existence one year. Its premises are in adobe houses such as are to be found in many villages in these parts. They have been simply adapted for their present purposes and the standard of cleanliness was pleasantly surprising. The staff consists of: (1) a sanitary inspector who looks after general sanitation, including mosquito control by insecticides and by drainage. (He makes a point of talking to the village people about water supply, latrines, etc.); (2) a nurse-midwife, whose duties are: ante- and post-natal care, examination of pregnant women, education of local midwives, regular supervision of the infants in the village. (There is no maternity clinic; the women are delivered in their homes); (3) a doctor, paid by the Foundation, who visits the centre once a week.

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70. The Mission as will be seen, formed a favourable impression of those whom it saw at Nashabeyeh. It was regrettable to learn that not only was the extension of the work hampered by lack of funds but that some local difficulties had arisen which suggested that there might still be some distrust of disinterested outside help in quarters that could not plead ignorance as an excuse. We had not the opportunity of pursuing inquiries to enable us to satisfy ourselves whether, if foreign direction and support were withdrawn, the work undertaken by the Foundation would collapse or become self-supporting, a point which had first been suggested to us in talks in Lebanon (see paragraph 10). We were, however, satisfied that if the venture were to collapse, it would not be due to any lack of a spirit of service or enthusiasm on the part of the Syrian field workers who are employed by the Foundation.

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71. The country is under-populated and the population is so scattered as to make it difficult to provide the usual facilities through community centres. It should be added that there are large tracts of empty but arable land; so that if, as a result of efficient health services, the expectation of life increases and infant mortality decreases, there is no danger of lack of food.

72. Recommendations: In the light of the present cautious attitude of the Syrian Government towards the receipt of technical assistance from external sources, we recommend that the initiative should be left with the Government to seek United Nations aid for the furtherance of any scheme of community organizations for which it may be directly or indirectly responsible.

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III. FINDINGS AND RECOMMENDATIONS

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73. The "Middle East" is a convenient but misleading description which may be applie to a group of Arab-speaking countries, not all of which were included in our itinerary. Those which we were privileged to visit have many features in common, in spite of differences in characteristics and ways of life and varying stages and patterns of development. The Islamic faith prevails over the greater part of the area, though in some countries there are important non-Moslem minorities. Each country is the inheritor of an ancient culture; each has subscribed to the United Nations Charter, with its emphasis on improved standards of living as a contributing factor to the peace of the world; each is predominantly agricultural; each, in a newfound independence and under conditions of political instability, is reforming its land laws; and each has proclaimed the welfare of the people as a dominating purpose of Government policy.

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74. In progress in community development in this group of countries little uniformity is to be observed. In Egypt, where the establishment of rural social centres became the official policy in 1939, after successful pioneering experiments conducted by the Egyptian Association for Social Studies, a stage has now been reached at which the whole scheme is under review, with the object of increasing its scope as efficiency. A reorganization involving decentralization and more inter-departmental co-ordination was in progress as we left Egypt.

75. We have found that Egypt is, compared with other Arab countries, well advanced as regards rural social centres since the population, or at least a part of it, understands the value of self-help. These social centres have to be expanded, both as regards numbers and the use made of each one of them. They do not require costly special buildings; provided that attention is paid to cleanliness, the work can be carried out in suitably equipped village houses, always assuming that the staff has the right spirit. To ensure a continuous standard of efficiency, regular supervision

241 with 1,032 in 1952; and 547 tractor planters, compared with 471. 1/ There were also, in 1952, 381 combines, 133 threshers and 108 harvesters. 2/

243 As table 30 shows, most of the increase in acreage was in cereals. Wheat and
242 barley yields continued to fluctuate violently, according to the amount of rainfall and weather conditions, but have showed no marked trend and, save in exceptional years such as 1949, have been well below a ton per hectare. Apart from mechanization, little has been done to improve methods of cultivation, apply fertilizers or use improved seed except in El Jezira, where high-yielding improved
433 seeds and fertilizers are sometimes used. Hence, in the post-war period, output
241 of grains has increased in the same proportion as acreage, or only slightly more. The expansion in cotton acreage, though smaller in absolute terms, was proportionately much greater; 3/ the acreage rose to 25,000 hectares in 1949 and 78,000 in 1950; the high prices prevailing in that year and the great profits made by cotton planters sent acreage up to 217,000 hectares, partly at the expense of wheat cultivation. The sharp decline in yields in 1951 and the steep fall in price in 1951 and 1952 caused heavy losses and led to a decline in acreage. Improved cotton prices and greater experience in cultivation once more caused an expansion in 1954.

241 The experience of the past four years has served to point out the potentialities and limitations of cotton cultivation in Syria. During the 1950-51 boom, cotton cultivation spread to most parts of the country, but subsequent events have shown that it is unsuited to many of them. In the Hauran, inadequate moisture has caused farmers to revert to wheat, barley and leguminous crops; in the Latakia region, soil and climate have also proved unfavourable. In the Damascus region, cotton cultivation has been practically discontinued. In the Aleppo region, as a result of the excessive costs of pump irrigation, cultivation is mainly confined to rain-grown cotton. 4/ In many parts of El Jezira, rice has replaced cotton owing to the shortage of labour. At present, cotton is localized chiefly in the Hama and Salamiye districts in central Syria, in the Hassetche district in El Jezira and in the province of Aleppo. About two-thirds of the total area is irrigated. Yields are about twice as high on irrigated as on rain-fed land, and the Syrian average, having almost doubled since the pre-war period, is one of the highest in the world. 5/

1/ Ministry of Finance, Budget Note, 1955 (Damascus, 1955).

2/ Figures obtained from Ministry of National Economy.

3/ Large-scale cultivation of cotton began in 1924, increased rapidly until 1931 and after a sharp fall during the depression reached its pre-war peak of 40,000 hectares in 1936. In this period, American type cotton replaced native varieties. During the Second World War, acreage once more declined, owing to the shift to grains.

4/ Bureau des documentations syriennes et Arabes, Etude spéciale sur le coton syrien (Damascus, 25 November 1952, mimeographed).

5/ Yields per hectare rose from 221 kilogrammes in 1951 to 243 in 1952, 363 in 1953 and 389 in 1954.